REMARKS

Claims 1-18 are pending, of which claims 1-9 and 18 are withdrawn. Claim 10 has been objected to and Applicant has amended the claim to overcome the objection.

Claims 10 and 17 have been rejected as being anticipated by USPN 4,824,713 to Brick. Claims 10-14, 16 and 17 have been rejected as being obvious in view of USPN 4,506,311 to Cline, and Brick. Claim 15 has been rejected as being obvious in view of Cline, Brick and USPN 5,841,066 to Bocherens. The Examiner acknowledges that Cline fails to teach a concave surface, but asserts that "mere changing shape of the essential working parts of a device involves only routine skill in the art."

Applicant respectfully disagrees and provides the following traverse.

The Disclosed Invention

The main object of the present invention is to obtain a diverter strip for lightning protection of exposed structures where the lightning is conducted - not in the strip or structure itself - but in an ionized channel of air just above the diverter strip. A strip consists of isolated segments of current conducting material placed in a layer of a non-conducting material.

The exposed parts of the segments acting as attracters to lightning are concave for, among other things, the following reasons:

- The lightning current will jump, in a controlled manner from one specific corner of a segment to the next, over the strip. Accordingly, if the segments are spaced accurately, the spark-over voltage and lift-off capacity of the strip can be determined and controlled.
- The concave shapes yield a far better connectivity and attachment of the segments to the surrounding non-conductive material than obtainable with convex shapes.

> This connectivity in turn prolongs the life span of the diverter, as the segments do not rip off by common wear or by lightning currents. The improved connectivity further ensures that lightning induced current cannot travel into the structure onto which the diverter is fastened, and further prevents the penetration of water, which otherwise reduces the life span of the diverter.

The shape of a segment is, in general, described and referred to as concave or non-convex, and different embodiments disclosed in the description and illustrated in the figures (e.g., page 7 lines 20-22, page 13, line 14-25 and figures 4, and 6-8) are cross-shaped, star-shaped, hen-feet shaped, and potato-shaped. The shapes of a cross and a star are recited in claims 12 and 13.

The Brick Reference

The Examiner has rejected Claim 10 as being anticipated by Brick.

Brick discloses lightning protected surfaces, where the conductive surface is coated with an electrically insulating protective coating, wherein electrically conductive particles are placed. The advantage is that lightning will strike several of these particles instead of hitting the surface in only one point. The figures, e.g. Figure 3, illustrates that, in a side view, particle portions embedded within the insulating protective coating 17 appear concave shaped. However, the Brick particles are actually irregularly shaped, as recited in dependent Claim 3 of Brick.

The present invention differs from Brick in several ways. First, in the present invention, lightning is conducted in an ionized channel of air just above the diverter strip - and not in the strip or structure itself. Second, the present invention comprises a diverter strip, which is to be placed on structures, while Brick comprises lightning protected surfaces, including the conductive surface itself. Third, the invention differs from Brick in that the exposed parts of each of the segments are described by concave shapes.

While Brick may illustrate that portions of irregularly shaped particles embedded within the insulating layer are concave, such disclosure by Brick is irrelevant to the invention, as disclosed in the specification and recited in the pending claims. The structural feature, of each segment having a concave exposed part, refers to the design of the part of the diverter strip controlling the spark-over voltage and lift-off capacity of the strip as well as the connectivity of the segments to the surrounding non-conductive material. There is no disclosure that the exposed part of each of Brick's particles (i.e., the non-embedded parts) can or should be concave when seen from a top view, as recited in pending Claim 10.

Cline in view of Brick

The Examiner has rejected Claim 10 as being unpatentable over Cline in view of Brick. Applicant notes that Cline, and its associated disadvantages, is referred to in Applicant's specification.

Cline discloses button- or diamond-shaped metal pieces, which are separately incorporated into a base, which is shaped as a ribbon. Both ribbons and strips are intended for installation outside of the nose of the aircraft. These strips, however, have the disadvantages of a short life span, as the segments easily rip off the base into which they are incorporated, either by lightning or by simple wear. Therefore, these ribbons often need to be renewed after being exposed to lightning, which is at least impractical if not impossible in many applications.

The Examiner agues that it would have been obvious to one of ordinary skill in the art to modify Cline's isolated segments to have a concave shape, and that such "changes in shape" involve "routine skill in the art". Applicant respectfully disagrees with this assertion.

A rejection based on "a mere change in shape" is only applicable to features having no mechanical function, i.e., ornamental features that cannot be relied upon to patently distinguish

the claimed invention from the prior art. See, In re Seid, 161 F.2d 229, 73 U.S.P.Q. 431 (C.C.P.A. 1947); In re Dembiczak, 175 F.3d 994, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999). Moreover, rejections based on "routine skill" are only applicable when, for example, the prior art discloses a generic group, and a patent applicant attempts to patent a subgroup. See, In re Aller, 220 F.2d 454, 456, 105 U.S.P.Q. 223, 235 (C.C.P.A. 1955). These scenarios do not describe the present invention.

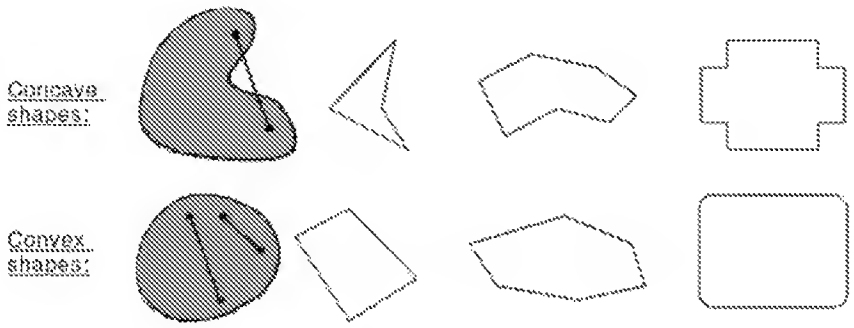
The added benefits of the concave shape of the exposed portion of each of the segments, as disclosed above, have not been disclosed in or appreciated by the prior art. Rather, the prior art conflicts with the present invention. For example, the exposed portions of each of the particles in Brick, illustrated in Figure 3, do not have a concave shape. Instead, at least some of Brick's particles have exposed portions which, while generally irregularly shaped, are more clearly convex. As such, Brick directly contradicts the claimed invention. Similarly, Cline's plates and buttons are not concave shaped. Therefore, Cline also teaches away from the claimed invention.

In view of the prior art, the claimed invention, which recites that the exposed portion of each of the segments is a concave shape, is not obvious. KSR International Co. v. Teleflex Inc., 550 US 398, 127 S. Ct. 1727, 82 USPQ2d 1385, 1396 (2007) (obviousness can be found when "one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions" to achieve predictable results); In re Geilser, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997) (a prima facie case of obviousness is rebutted when the prior art teaches away from the claimed invention).

Applicant respectfully provides for the Examiner the following discussion of concavity (or non-convexity). This discussion highlights the difference between a convex and a non-

convex shape, thereby underscoring the fact that Brick, and Cline modified by Brick, fails to disclose particles having such structural features.

> *A set in Euclidian space is convex if it contains all the line segments connecting any pair of its points. If the set does not contain all the line segments, it is concave.*
>
> This is also illustrated with the examples below of concave and convex shapes:



See also, Weistein, Eric, "Convex Polygon," WolframMathworld, Wolfram Research, Inc., http://mathworld.wolfram.com/ConvexPolygon.html, January 13, 2010;

As can be seen from the definition above, straight boundaries of a shape do not, without more, render the shape convex nor concave. A triangle is an example of a convex shape with straight boundaries (see, Weistein, Eric, "Triangle," WolframMathworld, Wolfram Research, Inc., http://mathworld.wolfram.com/Triangle.html, January 13, 2010), and a polygon with at least one angle greater than 180° is an example of a concave shape with straight boundaries. The shape of a star and a cross are hence also both concave (regardless of the boundaries being straight or not).

Based on the above discussion of the differences between the invention and the prior art, Applicant respectfully asserts that the pending claims are allowable over the art and respectfully requests a Notice of Allowance

Respectfully submitted,

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